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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/707,556	12/20/2003	Jordi Escoda	04657	1555

23688 7590 09/22/2005

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EXAMINER
BAUER, SCOTT ALLEN

ART UNIT	PAPER NUMBER
2836	

DATE MAILED: 09/22/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

AK

Office Action Summary	Application No.	Applicant(s)	
	10/707,556	ESCODA, JORDI	
	Examiner	Art Unit	
	Scott Bauer	2836	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-22* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-6,12-18 and 20* is/are rejected.

7)☒ Claim(s) *7-11,19,21 and 22* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *12/20/2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *20 December 2003*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Information Disclosure Statement

1. The information disclosure statement filed 12/20/2003 incorrectly lists Schmalz et al. as the patentee for US patent number 6388849. The IDS has been changed to list Rae as the patentee for US patent 6388849.

Claim Objections

2. Claim 1 is objected to because of the following informalities: Claim 1 discloses a method containing the step, "disconnecting the ***fee*** from the sampled load". For the purpose of this office action, it is assumed the applicant intended to disclose the term "feed" instead of "fee". Appropriate correction is required.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 1, 2 & 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Blades (US 5729145).

FIG. 13

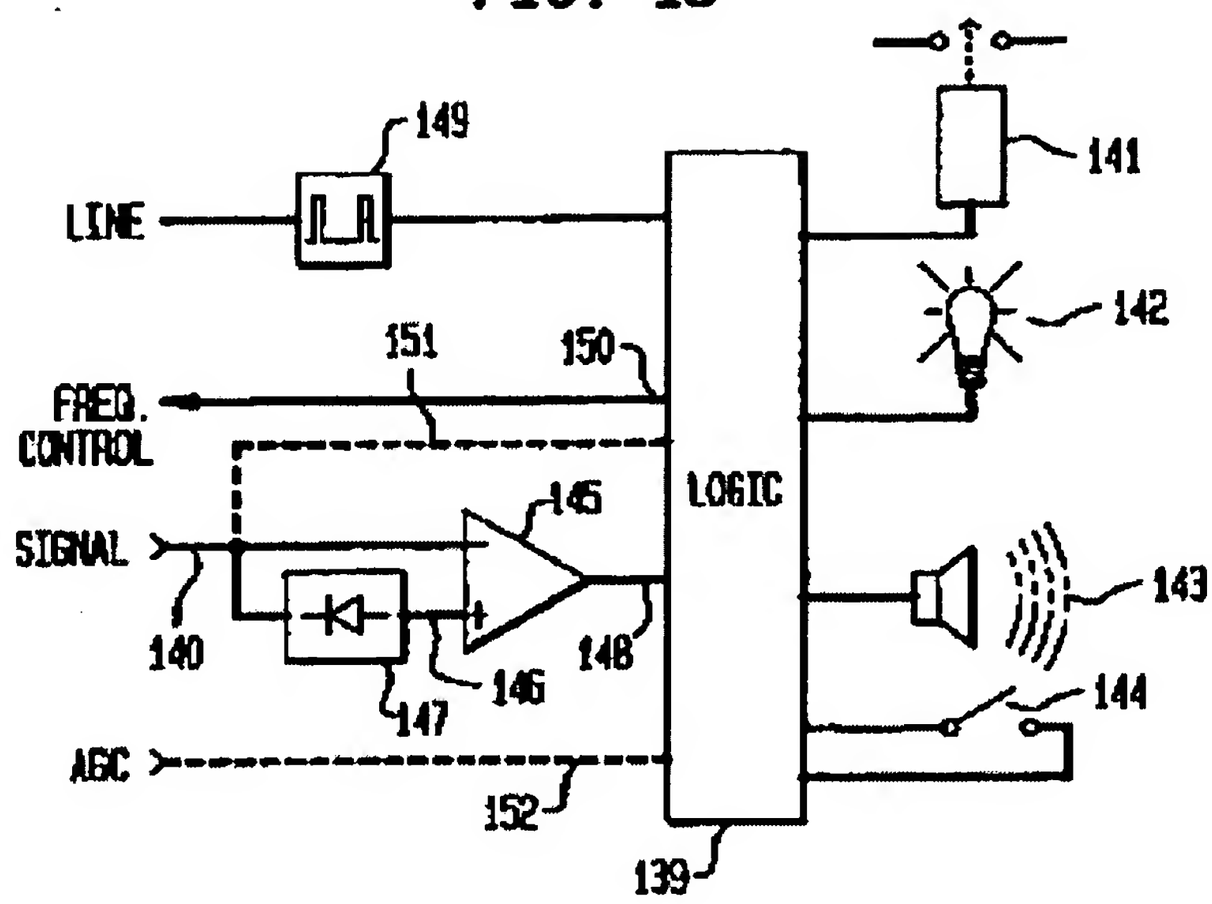
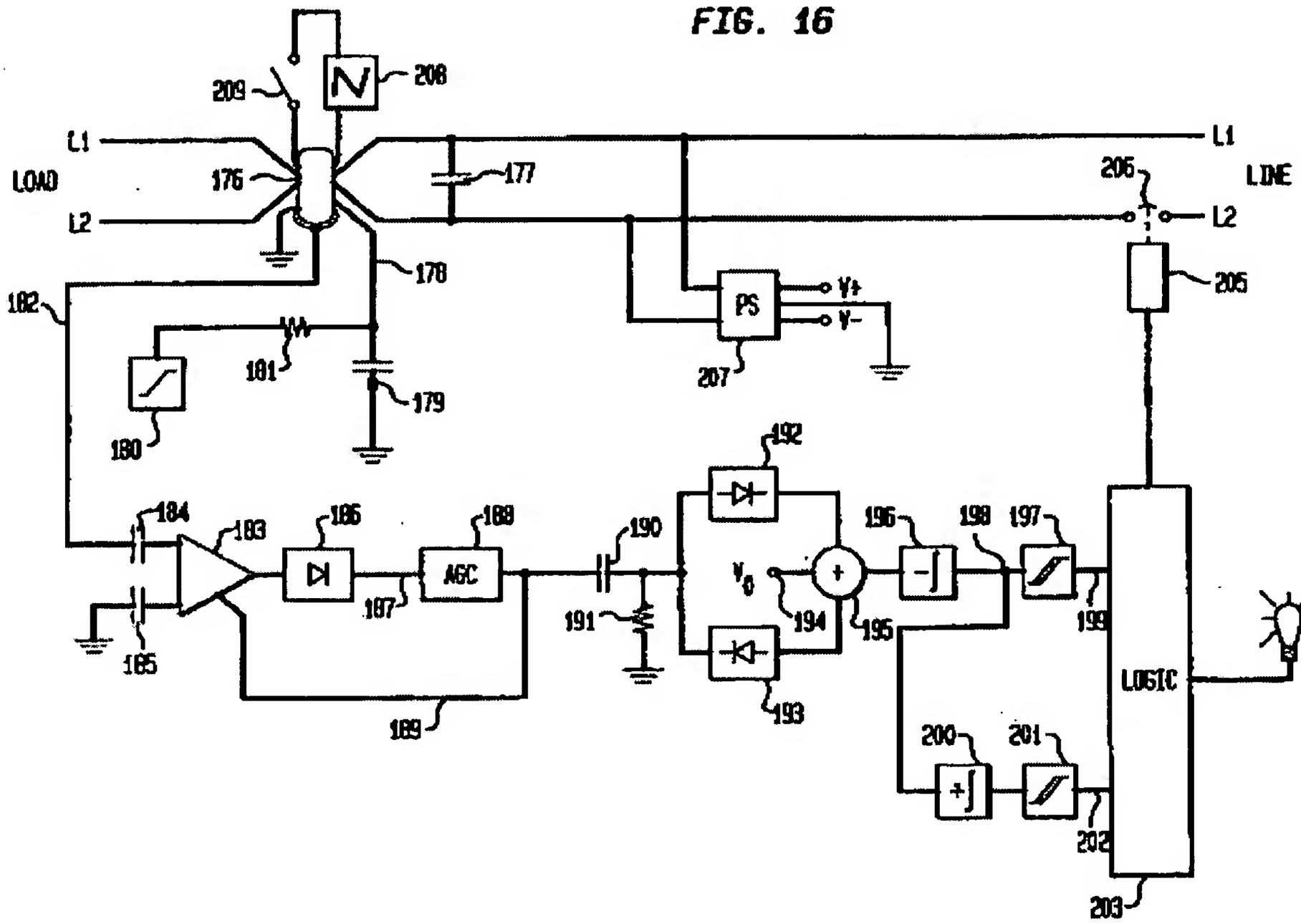

149
LINE
141
142
151
150
FREQ. CONTROL
LOGIC
145
SIGNAL
143
140
148
146
147
144
AGC
152
139

FIG. 16


209
208
L1
LOAD
176
177
L2
178
182
PS
V+
V-
181
179
207
180
492
184
183
186
188
190
196
198
197
AGC
V0
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191
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LOGIC
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203

5. With regard to Claim 1 Blades teaches a method for detecting an arc and protecting a load utilizing an electronic microprocessor based system to acquire samples of the current through a load, calculating an average value, of the acquired samples, referred to as the exponential running average (column 30 lines 42-46), updating the average value with each newly acquired sample (column 30 lines 65-67 & column 31 lines 1-3) and calculating a variable from the calculated average current value (column 31 lines 14-26).

Blades also teaches the step of disconnecting the feed from the sampled load and activating an alarm signal, which is an LED and an audible alarm (column 24 lines 64-67 & column 25 lines 1-6).

Blades further teaches the use of a dynamic threshold derived from the signal itself, to be used as an arc limit in detecting arc faults in a system (column 24 lines 41-43).

Blades does not teach the use of the calculated variable, referred in the reference as the synchronous average, as the arc limit for the signal, referred to in the reference as the dynamic threshold. However, Blades discloses that the same microprocessor can be used to derive a dynamic threshold, calculate the synchronous average value, and disconnect the feed from the load while signaling an alarm (column 25 lines 29-39).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the two teachings of Blades by using the synchronous average calculated by the microprocessor as the dynamic threshold for the purpose of

desensitizing the system to noise thus preventing a false trip, while allowing the system to detect an actual fault with greater accuracy.

For the purpose of this office action, the synchronous average (column 31 lines 14-26) taught by Blades, will be considered to be the arc detection threshold and the exponential running average (column 30 lines 42-48) will be considered as the average current value.

6. With regard to Claim 2, Blades, in figure 16, teaches a step wherein the current acquisition (176) is carried out independently for the load connected to the electrical assembly prior to the load.

7. With regard to Claim 20, Blades teaches a step wherein an average value is updated for each new current acquisition, taking into account eight or more immediately preceding current acquisitions (column 30 lines 42-46 & 61-63). Blades uses the value of 512 samples in one example.

Additionally, Claim 20 further limits Claim 1 only in the regard that it gives a specific range for the amount of samples that make up an average.

However, in the case In re Aller, the court stated, "[W]here the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation." See MPEP § 2144.05 [R-1].

Therefore, Claim 20 is rejected over "obviousness of ranges" as well.

8. Claims 3-6,12-15 & 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Blades in view of Macbeth (US 6798628).

9. With regard to Claims 3 & 4, Blades teaches the method discussed above in Claim 1 and further teaches the step of storing an arc detection threshold in a register once derived by a microprocessor (column 25 lines 29-37). Blades also teaches updating the value of the arc detection threshold and average current value for each new sample (column 30 lines 42-46 & 65-67 & column 31 lines 1-3).

Blade does not teach a step wherein said electronic system has a register of rated currents to be circulated through each of at least one of said loads determining preset current values indicating a maximum limit, a minimum limit, and an arc detection threshold for each of said at least one load.

Macbeth teaches the method as described in Claim 3 wherein an arc fault detection circuit has two predetermined arc fault detection levels indicating maximum and minimum current levels (column 2 lines 13-15).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Blades with Macbeth for the purpose of providing greater noise immunity and accuracy in a system that detects series and parallel arc faults.

10. With regard to Claim 5, Blades teaches a method of arc fault protection as described in Claim 4, wherein the calculation of an average current is used in arc detection circuitry (column 30 lines 42-46).

Blades does not teach comparing the calculated average of the sensed current to a maximum threshold.

However, Macbeth teaches a step of comparing the sensed instantaneous current to a maximum threshold.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Blades and Macbeth by substituting the running exponential average for the sensed instantaneous current, to compare with a maximum threshold current, and disconnecting a load if the average exceeds the threshold limit. The motivation for doing so would be to more accurately detect parallel arc fault conditions by analyzing the noise transmitted on a power line.

11. With regard to Claim 6, Blades in view of Macbeth teaches the method as described above in Claim 4.

Blades does not teach a method of storing values for maximum and minimum current limits. Blades also fails to teach a comparison between an acquired instantaneous current value and a minimum current limit, if the average current value for a load channel is lower then a maximum current.

Macbeth teaches a method for storing maximum and minimum current values as described above. Macbeth further teaches a method of detecting a series arc by

comparing an instantaneous current with a minimum current level if the instantaneous current level isn't greater then a preset maximum value (column 2 lines 10-17).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Blades with Macbeth by comparing an average current value with a maximum current value, and then comparing the instantaneous current value with a minimum current value for the purpose of more accurately detecting series and parallel arc faults by analyzing the noise transmitted on a power line.

12. With regard to Claim 12, Blades in view of Macbeth discloses a method as according to Claim 3 and further discloses all subject matter contained in Claim 12 except that it does not disclose that the maximum limit has a value substantially equal to about double a rated current and a minimum limit has a value substantially equal to about 10% of the rated current.

However, in the case In re Aller, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955) the court stated, "[W]here the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation." See MPEP § 2144.05.

13. With regard to Claim 13, Blades in view of Macbeth discloses the method as according to Claim 3, and further discloses all subject matter contained in Claim 13

except that it does not disclose that the maximum limit has a value greater than double a rated current and a minimum limit has a value of lower than 10% of said rated current.

However, it has been decided that, "where the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation." In re Aller, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955).

14. With regard to Claim 14, Blades in view of Macbeth discloses the method according to Claim 3. Blades in view of Macbeth further discloses a step wherein said arc detection threshold has a value between about 0.75 and about 0.9. Blades discloses a value of .935 which is about .9. (column 31 lines 14-26).

Additionally, Claim 14 further limits Claim 3 only in the regard that it gives a specific range for the value to be used for the arc detection limit threshold. Therefore, Claim 14 is rejected over "obviousness of ranges" as well.

15. With regard to Claim 15, Blades in view of Macbeth discloses the method as according to Claim 14. However, Blades in view of Macbeth does not disclose a step wherein an arc detection threshold is substantially equal to about 0.875.

However, Blades in view of Macbeth discloses all subject matter contained in Claim 13 other than the recited arc detection threshold.

However, it has been decided that, "where the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation." In re Aller, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955).

16. With regard to Claim 17, Blades teaches the method as descried above in Claim 2.

Blades does not teach a step wherein a sensor for acquiring current values forms part of a shunt structure.

Macbeth, teaches a method of arc detection wherein the load current is sensed across a resistive shunt element (column 4 lines20-23).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Blades with Macbeth by replacing Blades' current transformer with Macbeth's resistive shunt element for the purpose of reducing costs and using less space.

17. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Blades in view of Ragsdale (US 5280404).

18. With regard to Claim 16, Blades teaches a method of arc detection as decribed above in Claim 2 wherein a load is disconnected from its source by energizing a relay.

Blades does not teach a step wherein a sensor for acquiring said current values is integrated into a solid state relay responsible for deactivating the load where the arc or short circuit detection is positive.

Ragsdale, teaches a step of turning a solid state relay off when an arc fault is detected by a current sensor(column 4 lines 14-19).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Blades with Ragsdale by integrating the sensor with the solid state relay and using it to detect arc faults and disconnect the load from a power source for the purpose of saving space and cost while providing a reliable means for disconnecting the load from the source.

19. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Blades in view of Zuercher (US 6577138).

20. With regard to Claim 18, Blades teaches a method of arc detection described in Claim 1 above.

Blades does not teach a step wherein a sensor for acquiring current values is a Hall Effect sensor. Zuercher, teaches a step wherein the detector includes a sensor, such as, for example, a Hall effect or a shunt device (column 4 lines 20-21).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Blades with Zuercher for the purpose

of reducing cost and allowing the Blades' method to monitor a system that uses Pulse Width Modulation.

Allowable Subject Matter

21. Claims 7-11, 19, 21 & 22 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claim 7 is allowable because the prior art does not contain method according to Claim 6 further including the activation of a pre-detection signal and the setting of a counter variable to a value greater then zero, if the instantaneous current value is greater then a minimum limit and less then an arc limit value.

Claims 8-11, 19, 21 & 22 are allowable as being dependant on Claim 7.

22. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Scott Bauer whose telephone number is 571-272-5986. The examiner can normally be reached on M-F 8am-5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Brian Sircus can be reached on 571-272-2058. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

SAB

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PRIMARY EXAMINER